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US Dept. of Commerce Pat. & Trademark Office

Attorney's Docket No.

22058

TRANSMITTAL LETTER TO THE UNITED STATES
DESIGNATED/ELECTED OFFICE (DO/EO/US)
CONCERNING A FILING UNDER 35 USC 371

US. Application No. (if known)

09/980571

INTERNATIONAL APP. NO.
PCT/EP00/03390

INTERNATIONAL FILING DATE
14 April 2000

PRIORITY DATE CLAIMED
5 May 1999

TITLE OF INVENTION

VAPOR FOGGING FOR SPINNING SYSTEMS WITH RECTANGULAR NOZZLES

APPLICANT(S) FOR DO/EO/US

Heinz-Dieter BEECK et al

Applicant herewith submits to the United States Designated/Elected Office (DO/EU/US) the following .

1. ☒ This is a **FIRST** submission of items concerning a filing under 35 USC 371.
2. ☐ This is a **SECOND** or **SUBSEQUENT** submission of items concerning a filing under 35 USC 371.
3. ☐ This is an express request to begin national examination procedures (35 USC 371(f)) at any time rather than delay examination until the expiration of the applicable time limit set in 35 USC 317(b) and PCT Articles 22 and 39(1).
4. ☒ A proper Demand for International Preliminary Examination was made by the 19th month from the earliest claimed priority date.
5. ☒ A copy of the International Application as filed (35 USC 371(c)(2)).
 - a. ☒ is transmitted herewith (required only if not transmitted by the International Bureau.
 - b. ☐ has been transmitted by the International Bureau.
 - c. ☐ is not required, as the application was filed in the United States Patent Office.
6. ☒ A translation of the International application into English.
7. ☐ Amendments to the claims of the International Application under PCT Article 19 (35 USC 371(c)(3)).
 - a. ☐ are transmitted herewith (required only if not transmitted by the International Bureau.
 - b. ☐ have been transmitted by the International Bureau.
 - c. ☐ have not been made; however the time limit for making such amendments has NOT expired.
 - d. ☐ have not been made and will not be made.
8. ☐ A translation of the amendments to the claims under PCT Article 19 (35 USC 371(c)(3)).
9. ☐ An oath or declaration of the inventor(s) (35 USC 371(c)(4)).
10. ☐ A translation of the annexes to the International Preliminary Examination Report under PCT Article 36 (35 USC 371(c)(5)).

Items 11. to 16. below concern documents or information included:

11. ☐ An Information Disclosure Statement under 37 CFR 1.97 and 1.98.
12. ☐ An Assignment for recording. A separate cover sheet in compliance with 37 CFR 3.28 and 3.31 is included.
13. ☒ A **FIRST** preliminary amendment.
☐ A **SECOND** or **SUBSEQUENT** preliminary amendment.
14. ☐ A substitute specification.
15. ☐ A change of power of attorney and/or address letter.
16. ☒ Other items of information.
Drawing (3 sheets)

US Application no (if known)

International Application no.

JG13 Rec'd PCT/PTO 31 OCT 2001
Attorney's Docket No.

09/980571

PCT/EP00/03390

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17. The following fees are submitted.

Basic National Fee (37 CFR 1.492(a)(1)-(5):

Search report has been prepared by the EPO or JP \$890.00

Int'l prel. exam. fee paid to USPTO (37 CFR 1.482) \$710.00

No int'l prel. exam. fee paid to USPTO (37 CFR 1.482)

but int'l search fee paid to USPTO (37 CFR 1.445(a)(2)) \$740.00

Neither int'l prel. exam fee (37 CFR 1.482) nor

int'l search fee (37 CFR 1.455(a)(2)) paid to USPTO \$1040.00

Intl. prel. exam. fee paid to USPTO (37 CFR 1.482)

and all claims satisfied provisions of PCT Art. 33(2-4) \$100.00

CALCULATIONS PTO USE ONLY

\$1,040

ENTER APPROPRIATE BASIC FEE AMOUNT

Surcharge of \$130.00 for furnishing oath or declaration later than ☐ 20 ☐ 30
months from the earliest claimed priority date (37 CFR 1.492(e))

CLAIMS

NO. FILED

NO. EXTRA

RATE

Total claims

7

0

\$18

\$0

Ind. claims

0

0

\$84

\$0

MULTIPLE DEP. CLAIM(S) (if applicable) (see prel. amt.)

280

TOTAL OF ABOVE CALCULATIONS

\$1,040

Reduction of 1/2 for filing by small entity, if applicable Verified Small Entity Statement
must also be filed (37 CFR 1.2, 1.27, 1.28)

\$0

SUBTOTAL

\$1,040

Processing fee of \$130.00 for furnishing the English translation later than ☐ 20 ☐ 30
months from the earliest claimed priority date (37 CFR 1.492(f)).

TOTAL NATIONAL FEE

\$1,040

Fee for recording the enclosed assignment (37 CFR 1.21(h)). The Assignment may be
accompanied by an appropriate PTO-1595 cover sheet (37 CFR 3.28, 3.39)

TOTAL FEES ENCLOSED

Amt to be refunded

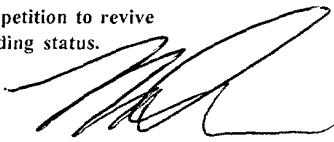
Amt to be
charged

- a. ☐ A check in the amount of \$ to cover the above fees is enclosed
- b. ☐ Please charge my deposit account 18-2025 \$ to cover the above fees. A copy of this sheet is enclosed.
- c. ☒ Please charge the amount due to the credit card identified in the attached PTO-2038
- d. ☒ The commissioner is authorized to charge any additional fees which may be required or credit any overpayment to deposit
account 18-2025. A copy of this sheet is enclosed
- e. A PTO-2038 in the amount of \$ to cover recordal of the Assignment is enclosed

NOTE: Where an appropriate time limit under 37 CFR 1.494 or 1.495 has not been met, a petition to revive
(37 CFR 1.137(a) or (b)) must be filed and granted to restore the application to pending status.

Send all correspondence to:

The Firm of Karl F. Ross P.C.
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 Herbert Dubno, Reg. No. 19,752

22058

IN THE U.S. PATENT AND TRADEMARK OFFICE

Inventor	Heinz-Dieter BEECK et al
Patent App.	Not known (US Nat'l phase of PCT/EP00/03390)
Filed	Concurrently herewith
For	VAPOR FOGGING FOR SPINNING SYSTEMS WITH RECTANGULAR NOZZLES
Art Unit	Not known

Hon. Commissioner of Patents
Washington, DC 20231

PRELIMINARY AMENDMENT

Prior to examination of the above-identified application,
please amend as follows:

In the Claims:

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Claim 3, line 1, delete "claims 1 and 2", insert instead
-- claim 1 --,

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Claim 4, lines 1 and 2, delete "one of the preceding claims", insert instead -- claim 1 --,

Claim 5, lines 1 and 2, delete "one of the preceding claims", insert instead -- claim 1 --,

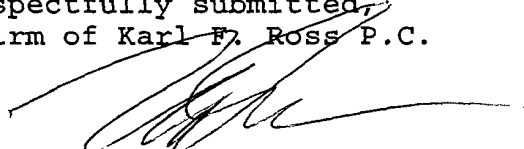
Claim 7, lines 1 and 2, delete "one of the preceding claims", insert instead -- claim 6 --.

Atty's 22058

Pat. App. Not known - US phase of PCT/EP00/03390

This preliminary amendment is submitted just to reduce
claim charges.

Respectfully submitted,
The Firm of Karl F. Ross P.C.



By: Herbert Dubno, Reg. No. 19,752
Attorney for Applicant

31 October 2001
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Transl. of PCT/EP00/03390

3/pstb

T R A N S L A T I O N

STEAM MISTING FOR SPINNING SYSTEMS WITH RECTANGULAR NOZZLES

5 The invention relates to the steam misting in the
production of polyamide filaments, especially for rectangular
spinning nozzles in accordance with the bottom loading concept and
a spinning system equipped therewith.

10 In the spinning of polyamides, especially for polyamide 6
[nylon 6], during the discharge of the filaments from the spinning
nozzles monomers and oligomers in the form of unpleasant smoke
clouds are produced which can be released in an uncontrolled manner
into the surroundings. In order to prevent this, these emissions
can be evacuated via suction nozzles which must be provided as
close as possible to the spinneret outlets. The functions and the
shapes of such suction nozzles have been made known in DE 198 36
15 682.5. From DE 198 30 453.6 it is known, further, that superheated
steam which serves to moisten the polyamide filaments and to
support the suction effect, can simultaneously increase the wiping
interval time for the spinning nozzle when blown directly
thereagainst.

20 Conventional devices which serve for the aforescribed
purposes are damaged however during the cleaning or replacement of
the nozzles. Thus it has been, for example, proposed at one time

to provide the conventional nozzle misting so that the steam is blown onto the longitudinal side of a rectangular nozzle stack centrally against the side wall of the relevant nozzle stack so that it then flows in the gap between the nozzle stack and the nozzle shaft in the spinning beam downwardly and is rerouted by a baffle plate more or less uniformly in the direction of the spinning plate. This device is, apart from the insufficiency of the moisturization produced, not usable for rectangular nozzle stacks in accordance with the bottom loading concept even to a lesser extent than is the solution for round spinning nozzles from the application DE 198 30 453.6 which differs based upon the after-heater which is directly following and also based upon concept.

Thus it is the object to provide a reliable apparatus which is service-friendly and is easy to clean for the steam moisturization of rectangular nozzles and the solution according to the invention has the features of the claims.

The advantage of the new steam misting resides in the good temperature control of the steam, whereby the steam feed is effected through a tube loop which passes through the heating chamber of the spinning beam so as to bring the steam up to the spinning temperature. Advantageously, the steam outlet bars are directly below the spinning beam and thus on the lower edges of the rectangular nozzle stack connected therewith, between the spinning beam and the after-heater. These steam outlet bars are equipped with a simple labyrinth for pressure equalization which can be fabricated especially inexpensively. The steam inlet is effected

initially respectively centrally to the rectangular nozzle stack and into an upwardly open and relatively broad distribution chamber along the rectangular nozzle stack.

This vertical distribution chamber transitions into a horizontal and very narrow gap space which opens into the spinning chamber. Into the latter, the steam is spread out and uniformly flows in the direction of the nozzles. This results so effectively that a misting from the ends inwardly is superfluous. A more detailed description of the method and the apparatus for steam misting of rectangular nozzles and the spinning system equipped therewith for producing polyamide filaments is provided below in conjunction with drawings. Thus in the drawings

FIG. 1 shows a section through a spinning beam into which the steam misting of the invention is built,

FIG. 2 shows a detail section of the steam misting in its assembled state and

FIG. 3 shows a detail section of the steam misting in the disassembled state.

FIG. 1 shows an exemplary spinning system. The section is through a spinning beam 1 with rectangular nozzles 2, its insulation 3 and the after-heater 4 as well as the monomer suction 5. Below it one can see the blowing device 6 and here also is represented the filament curtain 7 in the spinning chamber 8 of the after-heater 4. The steam feed is effected via a pipe loop 9 which extends through the heating chamber 10 of the spinning beam 1 so that already superheated steam is brought further to the spinning

temperature. Directly below the spinning beam 1 and thus on the lower edge of the rectangular nozzle stack 2 which is connected thereto, between the spinning beam 1 and the after-heater 4, on a longitudinal side - and with very wide spinning stacks on both sides - steam outlet bars 11 are provided which are each comprised of a base bar 12 and a distributor bar 13 forming together with the lower edge of the spinning beam 1 a labyrinth distribution chamber 14 which is described in greater detail below. The ends of the rectangular nozzle stack 2 do not need to be sprayed with steam however in any case.

In FIG. 2, the steam outlet bar 11 for the steam misting has been shown in a detail section in its assembled state, i.e. ready for operation and fixed between the spinning beam 1 and the after-heater 4. These steam outlet beams 11 are equipped with a simple labyrinth distribution chamber 14, for pressure equalization. This labyrinth-like distribution chamber 14 is laterally bounded by the base bar 12 and from above by the lower edge of the spinning beam 1 and itself can be formed mainly from cutouts 15, 16 in the distributor bar, forming a vertical distribution chamber 15 and a horizontal gap 16. From the pipe loop 19 the steam is introduced at 19 initially respectively centrally through the base bar 12, i.e. also centrally with respect to the rectangular nozzle stack 2 and opens into the upwardly open and relatively broad distribution chamber 15 longitudinally into the distribution bar 13. This vertical passage 15 transitions on into a horizontal, very small gap 16 which opens into the spinning

chamber 10. From this passage 16 the steam then flows in the direction of the nozzles transversely to the filament curtain 7.

FIG. 3 shows a steam outlet bar 11 in its disassembled state. On the base part 12 one can see the steam inlet 19 and the end of the tube loop 9 opening into it as well as the two fastening screw threads 17 for the distributor bar 13. On the distributor bar 13 one can recognize the screw hole 18 and the openly accessible cutouts 15, 16 for cleaning, namely, the vertical distribution chamber 15 and the narrower horizontal gap 16 which form the steam distribution labyrinth 14 once the device is completely assembled as has already been described.

The steam misting system is primarily conceived for use in apparatus for the spinning of high-strength polyamide yarns, but it can however be used universally wherever a spinning outlet surface is to be misted with steam or a moist spinning atmosphere is to be obtained. The use is therefore not limited only to bottom-loading spinning systems.

Reference Character List

Spinning beam [spinneret] (1)

Rectangular nozzles (2)

Insulation(3)

5 After-heater (4)

Monomer suction device (5)

Blowing device (6)

Filament curtain (7)

Spinning chamber 8 of the after-heater (4)

10 Tube loop (9)

Heating chamber (10) of the spinning beam (1)

Steam outlet bar (11)

Base bar (12); also base part

Distributor bar (13); also distributor part

15 Distributor chamber (14), labyrinth-like; also steam distribution
labyrinth

Distributor chamber 15, vertical; also first passage; also cutout

Gap (16), horizontal; also second passage; also cutouts

Fastening thread (17)

20 Screw hole (18)

Steam inlet (19), central

Patent Claims

1 1. A method and apparatus for the steam misting of
2 rectangular nozzles and spinning systems equipped therewith for
3 producing polyamide filaments, especially in accordance with the
4 bottom-loading concept, characterized in that, the steam required
5 for the steam misting initially flows through a tube loop lying in
6 the carrier steam of the spinning beam in order to heat it
7 approximately to the same temperature as the spinning temperature
8 itself, the steam being then passed through a pressure equalizing
9 distribution chamber (14) before it then directly emerges on the
10 entire longitudinal side of a rectangular nozzle stack (2) and
11 finally is directed in a uniformly distributed manner in the
12 spinning chamber (8) to the spinning plate.

1 2. The method and apparatus according to claim 1
2 characterized in that the pressure equalizing distribution chamber
3 (14) is arranged respectively along a single longitudinal side of
4 each rectangular nozzle stack and is configured in a labyrinth
5 shape and is fed only by a single steam inlet (19) from the tube
6 loop (9) centrally.

1 3. The method and apparatus according to claims 1 and 2
2 characterized in that the pressure equalizing and labyrinth-like

3 distribution chambers are respectively provided on both
4 longitudinal sides of the rectangular nozzle stack.

1 4. The method and apparatus according to one of the
2 preceding claims characterized in that the pressure equalizing and
3 labyrinth-like distribution chambers which have single centrally
4 oriented steam inlets (14) in their simplest form each are
5 comprised of at least two passages (15, 16) with rectangular cross
6 sections, which are open on their longitudinal sides and transition
7 between one another at right angles, whereby the first passage (15)
8 has two to a maximum of five times greater rectangular cross
9 sections than the subsequent second passage (16).

1 5. The method and apparatus according to one of the
2 preceding claims characterized in that the pressure equalizing and
3 labyrinth-like distribution chamber (14) which has a single central
4 and horizontally oriented steam inlet (19) have in their simplest
5 form each at least two passages (15, 16) with rectangular cross
6 sections which are open at their longitudinal sides and transition
7 between them at right angles, whereby the first and larger passage
8 (15) has an upwardly open rectangular cross section which runs into
9 the right angled horizontal and very small gap of the subsequent
10 second passage (16) which then opens with one of its longitudinal
11 sides into the spinning chamber and through which the steam is
12 uniformly distributed transversely to the filament curtain in the
13 direction of the nozzle.

1 6. An apparatus for the steam misting of rectangular
2 nozzles and spinning systems equipped therewith characterized in
3 that the pressure equalized and labyrinth-like distribution
4 chambers (14) each of which has a single steam inlet, has a steam
5 outlet bar (11) which in its simplest form is comprised of at least
6 two bars attached together by screws (12, 13) whereby the
7 respective base part (12) with the central steam inlet (19) is
8 fixed between the spinning beam (1) and the after-heater (4) and
9 that the distributor part (13) is also so connected by screws to
10 the base part (12) that it can be removed for cleaning.

1 7. The apparatus according to one of the preceding
2 claims characterized in that the pressure equalizing and labyrinth-
3 shaped distribution chamber (14) which follows a single steam inlet
4 (19) is configured as a simple steam equalizing labyrinth (14)
5 which is formed first by the fixed and smooth walls of the base bar
6 (12) second by the fixed and smooth underside of the spinning beam
7 (1) and third and fourth by the cutouts (15, 16) in the mounted
8 distributor bar (13).

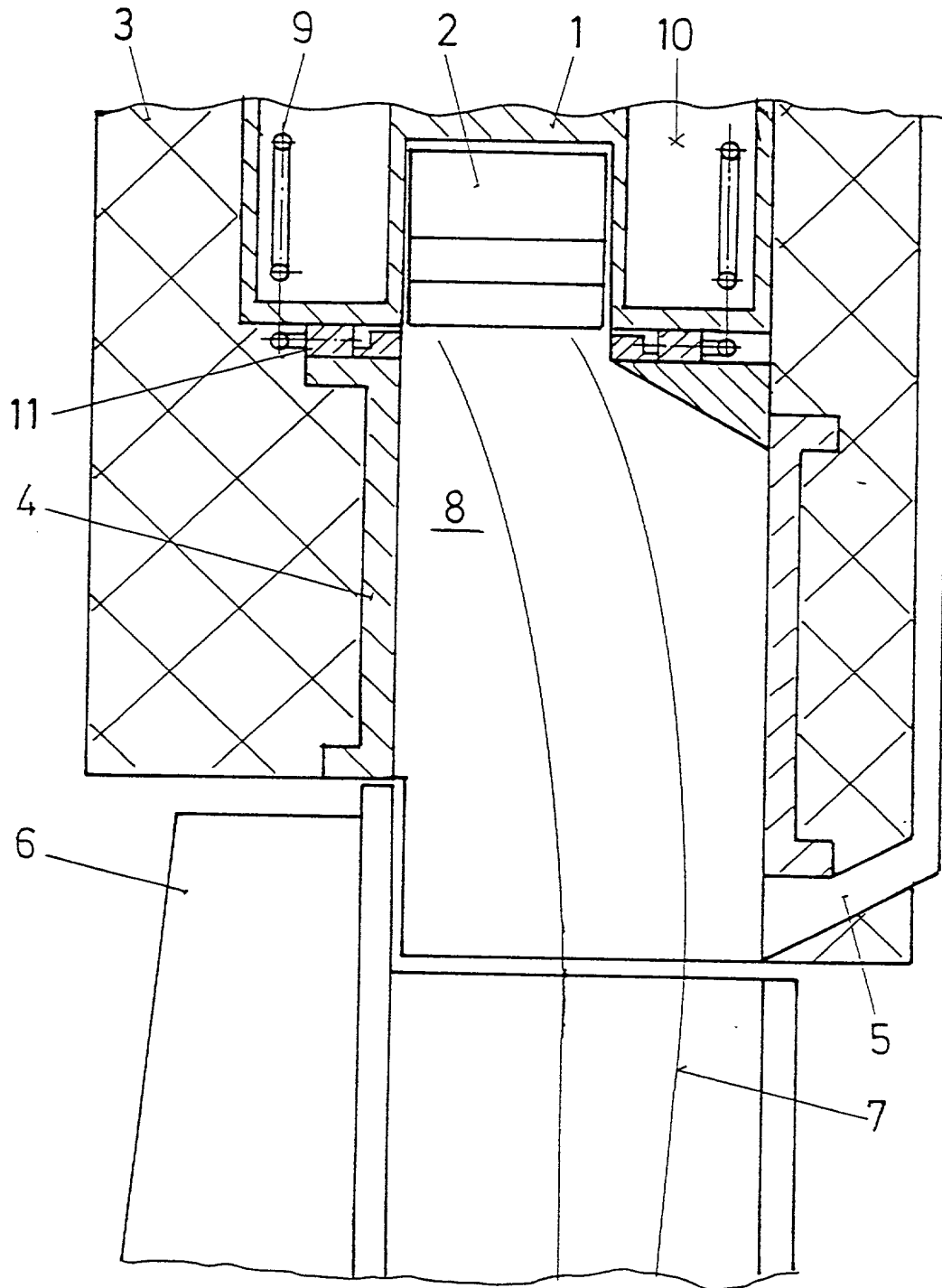


Fig.1

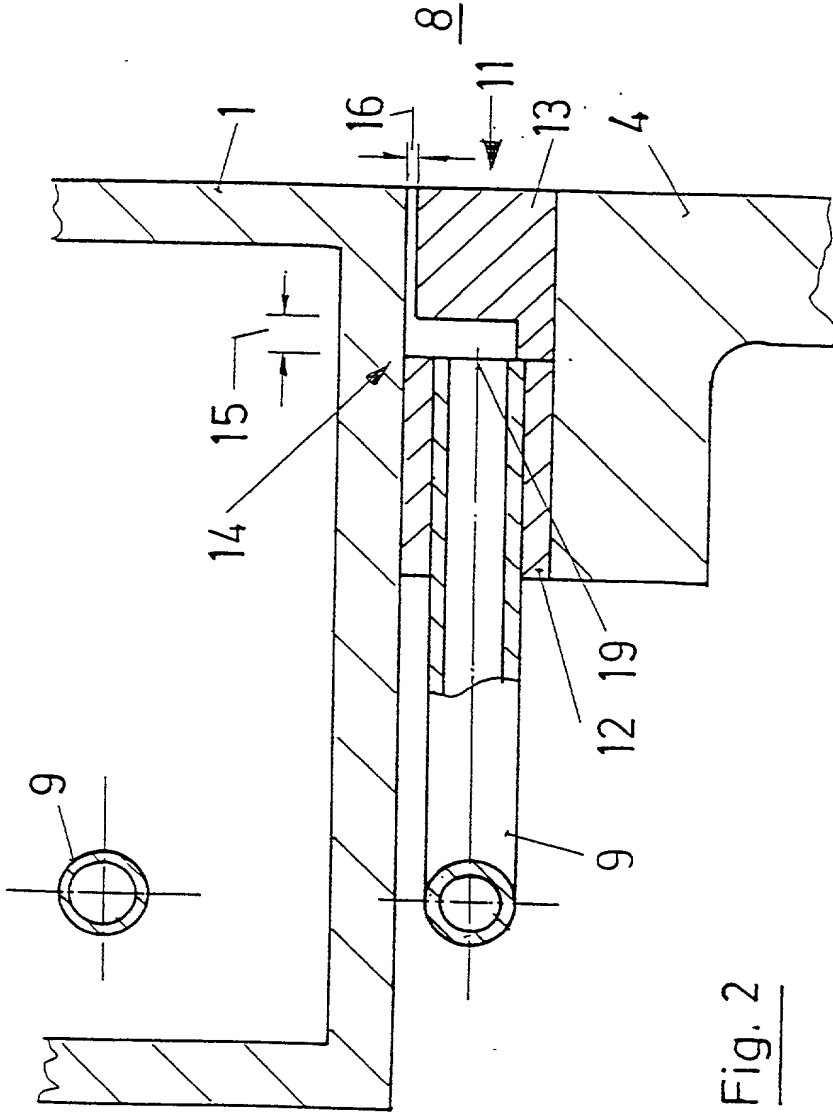
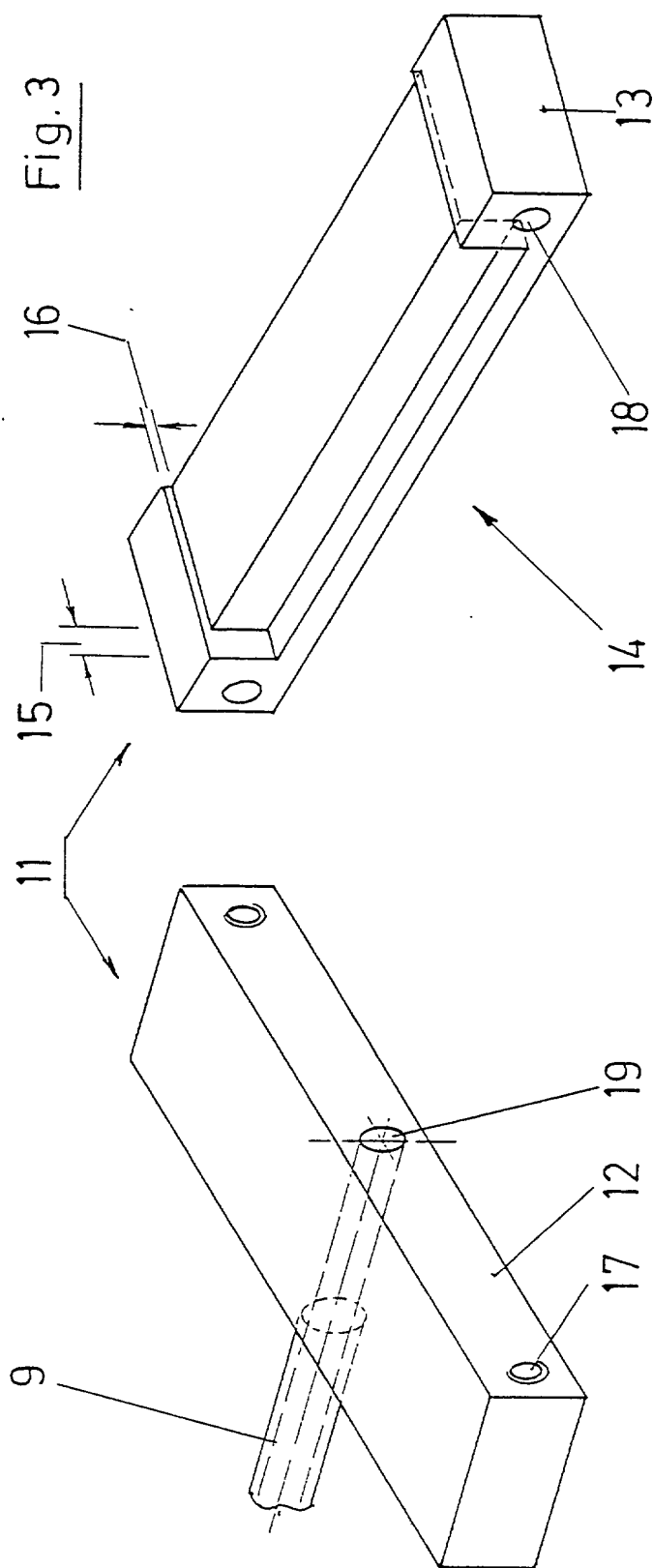


Fig. 2



DECLARATION AND POWER OF ATTORNEY

As a below named inventor, I hereby declare that: My residence, post-office address, and citizenship are as stated below next to my name,
I believe that I am an original joint inventor of the subject matter which is claimed and for which a patent is sought on the invention entitled

VAPOR FOGGING FOR SPINNING SYSTEMS WITH RECTANGULAR NOZZLES

the specification of which was filed on **14 April 2000** as PCT application **PCT/EP00/03390**.

I hereby state that I have reviewed and understand the contents of the above-identified specification, including the claims.

I acknowledge the duty to disclose information which is material to patentability as defined in 37 CFR 1.56.

I hereby claim foreign priority benefits under 35 USC 119 of any foreign applications for patent or inventor's certificate listed below and have also identified below any foreign applications for patent or inventor's certificate having a filing date before that of the application on which priority is claimed:

Prior Foreign Applications

Country	Number	Filing Date	Priority claimed
DE	19920682.1	5 May 1999	Yes

I hereby claim the benefit under 35 USC 120 of the United States Application(s) listed below and, insofar as the subject matter of each of the claims of this application is not disclosed in the prior United States Application(s) in the manner provided by the first paragraph of 35 USC 112, I acknowledge the duty to disclose material information as defined in 37 CFR 1.56 which occurred between the filing date of the prior application and the national or PCT international filing date of this application:

Serial Number	Filing Date	Status
PCT/EP00/03390	14 April 2000	Pending

I hereby appoint as attorneys to prosecute this application and to transact all business connected therewith: **Herbert Dubno**, Reg. 19,752; **Jonathan Myers**, Reg. 26,963; **Andrew Wilford**, Reg. 26,597 and each of them individually.

Address all correspondence to:

The Firm of Karl F. Ross, P.C.
Customer Number 535

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Bronx, New York 10471-0900
(718) 884-6600

Direct all telephone calls to:

I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or

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Ser. No. Not known - US phase of PCT/EP00/03390

both, under 18 USC 1001 and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.

Full name of first inventor:

Heinz-Dieter BEECK

1-158 Inventor's signature

Heinz-Dieter BEECK

Date:

11/08/01

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2-00 Inventor's signature

Rainer TIETZE

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Citizen of Germany

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